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A NEW OENOTHERA.

REGINALD RUGGLES GATES.

(Plates 100 and 101.)

My cultures of *Oenothera* from seeds collected wild in various parts of the North American continent, have yielded a bewildering profusion of forms, races related to *O. biennis* L. and *O. muricata* L. being especially numerous. As is always the case when the number of forms under observation begins to be multiplied, the older lines of distinction between "species" break down, and it becomes finally an arbitrary matter, decided by convenience, where the line between two formerly distinct Linnaean species is to be drawn. Thus the multiplication of forms belonging to the two species mentioned above has necessitated drawing a more or less arbitrary line between them, as I have explained elsewhere,¹ and ranking all races on one side of this line with the *O. biennis* series, and all on the other side with the *O. muricata* series. Such a decision is of course based on a single character, because no two differential characters will hold for all the forms concerned.

I chose for this purpose the character of flower-size, and reckon all species of this group having petals 12-30 mm. in length, as belonging to *O. biennis*, and all having petals 9-15 mm. in length, with *O. muricata*. Flower-size is the most convenient character on which to base distinctions, and the same treatment should therefore be applied to *O. grandiflora* Sol.,² *O. Lamarckiana* Ser., and other species of the

¹ Gates, R. R. "Mutation in *Oenothera*." Amer. Nat. 45: 577-606, 1911.

² I pointed out elsewhere (Amer. Nat. 45: 588. 1911) that Solander should be credited with this species.

group. For example, species having small flowers with the *O. biennis* characters should be reckoned as belonging with the *biennis* series, even though they may have foliage more or less resembling *O. Lamarkiana*. This distinction is all the more important because the size of flower is usually correlated with other important flower differences, such as the habit of open- or close-pollination, while any of these flower characters may be found combined with any type of foliage.

This manner of treatment does not mean, of course, that Linnaean species should be differentiated on the basis of single characters, for obviously that is not what is meant by the species, the unit of systematists.

Notwithstanding the fact that single characters must be resorted to in classifying large series of races under one or another Linnaean species, yet this method is not always applicable, for races occur which represent such distinct combinations of characters that they are at once recognized as worthy of specific rank.

This is evidently the case with the species to be described in this paper. In its flower characters it belongs to the *biennis* series, yet in its foliage and its nearly glabrous character it clearly resembles *O. argillicola* Mack. But it possesses other features, such as the clearly subterminal sepal tips, which are reminiscent of another section of the genus.

The plants from which this species is described, were grown this year at the John Innes Horticultural Institution, Merton, Surrey, from one of several packets of seeds collected at Ithaca, New York, by Mr. H. B. Brown in 1909 and sent to me through the kindness of Professor W. W. Rowlee of Cornell University. Some of the other packets collected from this region gave races very distinct from this and resembling much more the ordinary *O. biennis* forms.

I at first intended giving this species the very appropriate designation *O. angustifolia*, but since that name is now a synonym, having been used by Miller, I have substituted *O. angustissima*. Type specimens from plants grown this year, are to be found in the British Museum (Natural History), London. The accompanying photographs, kindly taken by E. J. Allard, illustrate a rosette and two flowering shoots together with three leaves from the mature rosette. The description is as follows:

Oenothera angustissima, sp. nov.

Leaves of mature rosette:—Length about 29 cm., greatest width

24–26 mm. Blade long, narrow, lanceolate, narrowing gradually to petiole, margin repand-denticulate, sometimes very obscurely so, more distantly repand-dentate below; midribs pinkish, broadening below to a wide, long, unmarginated petiole which is triangular in cross-section and greenish white on ventral surface. Veins on ventral surface of blade somewhat rugose, a very scattering, inconspicuous pubescence of fine, short hairs on both surfaces.

Mature plant:—Central stem nearly two metres high, with a ring of ascending crown branches (arising from the rosette) which frequently reach a greater height than the central shoot. Stems terete, fairly stout, reddish, nearly glabrous but bearing in places a few scattered short hairs and also very scattered long hairs which arise from red (anthocyanic) papillae. Late in the season (in this climate), very slender, short, terete secondary branches appear.

The lower cauline leaves have the same shape and other features as the radical leaves, but they are smaller, 25 cm. long, by 15.5 mm. wide, of nearly uniform width throughout the greater part of their length. The upper cauline leaves become gradually shorter with shorter petioles. Lowermost bracts 10 cm. long by 21 mm., in extreme width, scarcely petiolate, lance-pointed, narrowed abruptly at base; upper surface and veins on lower surface bearing a few short, scattering hairs; margin distantly and very obscurely glandular-denticulate. Upper bracts shorter, broader at base, and more or less curled or waved.

Flowering late in the season (nearly end of August when grown in the English climate as an annual). Inflorescence rather loose, tip of stem nutating as in *O. ammophila* Focke, and some forms of *O. muricata* L.

Flowers:—Petals 20 mm. long by 19 mm. broad, emarginate, deep yellow, not opening out flat, style short (stigma surrounded by the anthers), lobes of stigma usually opening only to an angle of about 45°. Length of hypanthium 24 mm., length of ovary 13 mm., thickness of ovary nearly 3 mm., thickness of hypanthium slightly over 2 mm.; length of bud cone 15 mm., diameter at base nearly 5 mm., length of sepal tips 5 mm. Sepal tips subterminal, hence separated at base, nearly parallel or somewhat spreading, reddish on inner face, especially at base, and in young buds. Buds nearly glabrous, cone slightly quadrangular, reddish stripes on margins of each sepal, median ridge green, hypanthium usually faintly pinkish, ovary reddish, with scattered red papillae bearing long hairs, hypanthium with scattered short hairs, sepals shiny, with very scattered long and short hairs.

Capsules:—Reaching 35 mm. in length, about 6.5 mm. in diameter, gradually tapering from near the base, green or with scattered patches of red, nearly glabrous, but with few, scattered long hairs, arising from mostly green papillae.

Diagnosis:—Herba biennis. Folia radicalia longa, angustissimē

lanceolata, longē petiolata, circa 29 cm., longa et 25 mm. lata, utrinque sparsē pubescentia. Folia caulina gradatim breviora, breviter petiolata. Caulis teres, subglaber, basi ramis pluribus verticillatis ascendentibus ipsum saepe excedentibus instructus. Spica sublaxa, superne nutans. Petala flava, circa 20 mm. longa, ascendentia. Antherae stigmata attingentes. Alabastrae subglabrae, obsoletē quadrangulares, apices sepalorum subterminales.

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EXPLANATION OF PLATES.

Plate 100. *Oenothera angustissima*, sp. nov. Rosette, showing the beginning of the crown branches before the central stem appears.

Plate 101. The same. Two flowering shoots showing leaves, flowers and fruits; and three leaves from the mature rosette.

SYSTEMATIC STUDIES ON OENOTHERA,—II. THE DELIMITATION OF OENOTHERA BIENNIS L.

HARLEY HARRIS BARTLETT.

(Plates 102 and 103.)

THE problem of limiting the application of the name *Oenothera biennis* L. to one of the many forms which now pass under this name is largely bibliographical, to be solved by a careful analysis of the Linnaean account (Sp. Pl. ed. 1. p. 346. 1753.) which is quoted below:

biennis 1. OENOTHERA foliis ovato-lanceolatis planis. *Vir. cliff.* 33. *Hort. ups.* 94. *Gron. virg.* 254. *Roy. lugdb.* 251. *Gort. gelr.* 78.
Oenothera foliis ovato-lanceolatis denticulatis, floribus lateralibus in summo caulis. *Hort. cliff.* 144.
Lysimachia lutea corniculata. *Bauh. pin.* 245. 516. * *Moris. hist.* 2. p. 271, f. 3, t. 11, f. 7.
Habitat in Virginia unde 1614, nunc vulgaris Europae. ♂

Although no part of this account is original to the *Species Plantarum*, Linnaeus was himself the author of the first two of the three polynomials of which it consists. In 1737 Linnaeus published companion works, the *Viridarium Cliffortianum* and the *Hortus Cliffortianus*, in which these polynomials first appeared. We find in the

preface to the *Viridarium* the following explanation of the relationship between the two works:

"Nomina quibus enumerantur plantae mutuata sunt ex Horto Cliffortiano fere omnia (paucis emendatioribus), singulis adjecto duplici numero, quorum priore paginam Horti Tui indicavi, posteriore vero generis speciem, ut si quae differentia minus indubitata occurreret, in majori opere eo facilius consulerentur synonyma."¹

It is therefore clear that the following accounts, with the exception of the synonymy which is quoted in the *Hortus*, refer to the same plant.

"*Oenothera foliis ovato-lanceolatis planis.*

Oenothera foliis ovato-lanceolatis denticulatis, floribus lateralibus in summo caulis. 144. 1."

Virid. Cliff. p. 33.

"1. *Oenothera foliis ovato-lanceolatis denticulatis, floribus lateralibus in summo caulis.*

Onagra latifolia. *Tournef. inst.* 302.

Lysimachia lutea corniculata. *Bauh. pin.* 245. 516.

Lysimachia lutea corniculata non papposa virginiana major.

Moris. hist. 2. p. 271. f. 3, t. 11. f. 7.

Lysimachia lutea corniculata latifolia lusitanica. *Barr. rar. t.* 1232.

a *Onagra latifolia, floribus amplis.* *Tournef.*

Onagra latifolia, flore dilutiore. *Tournef.*

Crescit in Virginia, aliisque Americae locis, ante centum et viginti annos in Europam translata, nunc spontanea facta, copiose crescit ubique in campis arenosis Hollandiae.

Primo anno vix floret, altero floret et perit."

Hort. Cliff. p. 144.

The third polynomial quoted by Linnaeus in the *Species Plantarum*, *Lysimachia lutea corniculata* Bauhin, has not been satisfactorily identified by recent authors.² Nevertheless Bauhin's description is a lengthy one, and, for his time remarkably satisfactory, so that it is

¹ "The names by which the plants are enumerated are almost all taken from the *Hortus Cliffortianus*, a few having been somewhat improved and to each having been added a duplex number, by the first part of which I have indicated the page of your *Hortus* and by the last the species of the genus, so that if any somewhat doubtful distinction should present itself, the synonyms of the larger work might be the more readily consulted."

² Dr. R. R. Gates at one time attempted to identify *Lysimachia lutea corniculata* with what we now know as *Oenothera Lamarckiana*. See the following papers:

The earliest description of *Oenothera Lamarckiana*. *Science*, 2d. ser. xxxi (1910) pp. 425-426.

Early historico-botanical records of the *Oenotheras*. *Proc. Iowa Acad. Sci.* xvii (1910) pp. 85-124.

by no means improbable that his plant, which was the first *Oenothera* to be introduced into the botanical gardens of Europe, may yet be identified with some degree of plausibility. Whatever Bauhin's plant may have been, however, there is nothing in the description to indicate its identity with the Linnaean plant of the sand-dunes of Holland. It cannot, therefore, be chosen as the type to bear the name *Oe. biennis*, since a Linnaean species should certainly be typified by a plant with which Linnaeus was himself acquainted.

In the case of many hopelessly composite Linnaean species the name has been associated by later botanists with that one of several synonyms which Linnaeus referred to in the closing line of the diagnosis,—“Habitat in Virginia,” or perhaps “Habitat in Canada.” In such a case Linnaeus has been tacitly interpreted as having himself pointed out that a Gronovian diagnosis (sometimes associated with a Clayton specimen) or a Kalm specimen in his herbarium, should be crucial in interpreting his species, rather than earlier references to plants of which he had no personal knowledge. In the case of *Oenothera biennis*, however, the “Habitat in Virginia unde 1614, nunc vulgaris Europae” clearly refers to the similar statement in the *Hortus Cliffortianus*, “Crescit in Virginia, aliisque Americae locis, ante centum et viginti annos in Europam translata, nunc spontanea facta, copiose crescit ubique in campis arenosis Hollandiae,” and affords no basis whatever for selecting as the type of *Oe. biennis* any other plant than that which grew in the dunes of Holland. As a matter of fact, *Oenothera foliis ovato-lanceolatis planis* L. was admitted to Gronovius' *Flora Virginica* (p. 154, not p. 254 as cited in *Sp. Plant.*) on the basis of Linnaeus' statement in the *Hortus Cliffortianus* that the plant of Holland had been introduced from Virginia, and not on the basis of notes or specimens from Clayton.

The plant which grew abundantly on the sand-dunes between Haarlem and Leyden in 1737, which Linnaeus was probably able to see in the course of a half hour's walk from the garden of Clifford, was no doubt the same species which is common there today. The fact that it has not been exactly duplicated in the material which has recently been assembled from American localities is not at all surprising, in view of the fact that our flora contains a number of closely related species and varieties, some of which seem to be very local in their distribution. I am informed by Professor de Vries that there are but two strains of *Oenothera* in the vicinity of Amsterdam which

conform to what is usually called, in a collective sense, *Oe. biennis*. They differ only in flower color, one having flowers of a lighter color than the other. The light-colored form has only become abundant in recent years, through its prompt occupation of a newly created habitat, the rights of way of the more recently constructed railroads. It has long occurred at many localities in Holland, however, and may be identified with reasonable certainty with the var. *a* of Linnaeus' *Oenothera foliis ovato-lanceolatis denticulatis, floribus lateralibus in summo caulis* (Hort. Cliff.). To be sure Linnaeus assigned this plant no name of his own, citing merely two polynomials of Tournefort's. One of them, however, *Onagra latifolia, flore dilutiore* Tourn. was merely a new name for Hermann's *Lysimachia corniculata non papposa, Virginiana, major, flore sulphureo* (Hort. acad. Lugd.-Bat. Catalogus, 1687) which was grown and described at Leyden half a century before Linnaeus' residence in Holland. We are therefore justified in treating the lighter-flowered plant of Holland as a variety of the other, which is to be regarded as the type of *Oenothera biennis*. The two plants, according to Professor de Vries, differ in the one character only.

It would hardly have been worth while to give in so much detail the reasons for selecting the common plant of Holland as typical *Oenothera biennis* but for the fact that certain botanists do not seem to realize that such a selection should be made according to principle. Dr. Britton, for instance, seems to have been able to select from among the American *Oenotheras* one which he arbitrarily pronounced to be *Oenothera biennis* "in the strictest sense."¹

In a recent paper, Dr. Gates² has mentioned a specimen in the Linnaean Herbarium which he calls "the type specimen of Linnaeus's *Oenothera biennis* in the Species Plantarum." It would seem to be unnecessary to point out that Linnaeus had no "types" in the modern sense, and that the specimens in the Linnaean Herbarium cannot be

¹ "...a number of plants of *Onagra biennis* (in the strictest sense), growing in uncultivated land in the New York Botanical Garden in 1903, were selected to form the basis of a pedigree culture in 1904." Macdougall, Vail, Shull, and Small; *Mutants and Hybrids of the Oenotheras*, p. 9, 1905. "Parental individuals were selected and verified by Dr. N. L. Britton in 1903, and from the seeds furnished by them the plants were grown which furnished material for the descriptive diagnosis published in a previous paper (Macdougall, Vail, Shull and Small, 1905). This is not the species growing wild in Europe and cited by de Vries in his 'Mutationstheorie.'" Macdougall, Vail, and Shull: *Mutations, Variations and Relationships of the Oenotheras*, p. 56, 1907.

These quotations refer to the same culture.

² Gates, R. R.: *Mutation in Oenothera*. *American Naturalist* xlv (1911) pp. 577-606.

considered as "types" unless there is actual evidence that Linnaeus drew up his description wholly or in part from the preserved specimen.¹ In the case of *Oenothera biennis*, especially, where nothing in the account given in the *Species Plantarum* is original to that work, no herbarium specimen can be interpreted as a type unless it is definitely associable with the *Hortus Cliffortianus*. Mr. Gates himself states² that "...the actual specimens in the British Museum...which are supposed to have served as the types for the *Hortus Cliffortianus* are not fully authenticated. The handwriting is said not to be that of Linnaeus..." etc. Under the circumstances the best course seems to be to accept as true *Oenothera biennis* the common plant of Holland which Professor de Vries has referred to under this name in his *Mutationstheorie*. A diagnosis of this plant follows.

OENOTHERA BIENNIS L. Biennial. Mature rosettes large, sometimes 65 cm. in diameter (smaller if forced to flower the first year). Outer leaves with petioles 9–10 cm. long and oblanceolate or oblong lanceolate blades, 20–24 cm. long, 5.5–7.5 cm. broad, gradually narrowed to the sinuate-dentate base, distantly and minutely repand-denticulate toward the abruptly obtuse or acutish apex, with a sparse pubescence on both sides of short, sharp, arcuate hairs. Flowering plant about 7–10 dm. high, roughly pyramidal in outline, bearing cauline branches in all the lower axils, and flowers in all the upper axils of the main axis; branches with empty axils below and flowers above; stems and foliage green. Stem pubescence consisting of four types of hairs: I sharp-pointed, thick-walled granulose-roughened hairs from a tuberculate base (few); II similar but shorter hairs varying greatly in length, without a tuberculate base (the predominant type); III thin-walled hairs, round at the apex, of practically uniform diameter, or slightly clavate (few); and IV very small, ampulliform thin-walled hairs (mostly in the inflorescence). Lower stem leaves with blades about 16 cm. long, 4.5 cm. wide, lanceolate, acute, distantly denticulate, tapering at the repand-dentate base to a petiole about 4 cm. long. Uppermost stem leaves short-petioled, forming a gradual transition to the lower bracts, 10 cm. long, 3 cm. wide. Lower leaves of the branches (subtending neither branches nor flowers) ovate, acute, 5.5 cm. long, 3 cm. wide. Leaf-like lower bracts of both primary and secondary axes passing gradually to practically entire narrowly lanceolate bracts about 25 mm. long and 4 mm. wide, (i. e., $2\frac{1}{2}$ times as long as the ovary at flowering time), clothed with hairs of type II above and types II and III below. Flowers of medium size. Ovary 10 mm. long. Hypanthium 35 mm. long, slender, expanding from a diameter

¹ In this connection see —

Hitchcock, A. S.: *Types of American Grasses*. Cont. U. S. Nat. Herb. xii (1908) p. 115.

² *Am. Nat.*, xlv (1911) p. 587.

of 1.3 mm. near the base to 3 mm. at the orifice, sparsely pubescent with a few arcuate hairs of type II and more numerous perpendicular hairs of type III. Calyx segments deflexed in pairs, about 23 mm. long and 4 mm. wide above the base, bearing slender, strictly terminal, red-tipped free appendages 3 mm. long, moderately pubescent, hairs of type II sparse near base but very abundant on the free calyx-tips, hairs of type III predominant except on the free tips, where they are lacking, hairs of type IV abundant on the free tips but absent elsewhere. Petals yellow, becoming darker on fading with a reddish area at the base, obcordate, 20 mm. long, 27 mm. wide. Stigma lobes 6–7 mm. long, appressed, lying at the center of the unopened bud (therefore shorter than the corolla after expansion) surrounded by the slightly longer anthers. Capsules loosely aggregated but still overlapping in the lower part of the fruiting spike, rather more densely aggregated above, mostly between 23 and 27 mm. in length, shorter than the subpersistent foliaceous bracts except above, subquadrangular, apices of the valves neither spreading nor conspicuously emarginate, sparsely pubescent with arcuate hairs of type II and densely viscid-puberulent with very short hairs of type III. Seeds light brown, rather large, 1.7 to 2 mm. long.—Seed received in 1910 from Professor de Vries with data as follows: "*Oenothera biennis*. Pure seed, fertilized by myself in my garden from plants whose parents were collected in the sand-dunes of Holland. . . . The pure race,—the *biennis* often contains the var. *sulphurea*." Plants set out at Bethesda, Md., in the spring of 1911 did not flower during that season and were winter-killed. Sister plants, however, flowered in the garden of Prof. B. M. Davis at the Bussey Institution, and were self-pollinated by him. Their progeny, forced by being started in the greenhouse in the winter and set out early in the spring, flowered in 1912 both at Philadelphia and Bethesda. Herbarium specimens; *Bartlett* 2723, 3113 and 3160.

Oenothera biennis* var. *sulphurea de Vries *in litt.* *Formae speciei typicae omnino similis floribus pallidioribus sulphureis exceptis.* An *Lysimachia corniculata non papposa, Virginiana, major, flore sulphureo* Herm. (Hort. Lugd.-Bat. Cat. p. 396. 1687) et *Lysimachia lutea corniculata flore sulphureo* Herm. (Florae Lugd.-Bat. Flores, p. 95. 1690) et *Oenothera foliis ovatolanceolatis denticulatis, floribus lateralibus in summo caulis*, var. *a*, Linn. (Hort. Cliff. p. 144. 1737)? — Occurring with the typical form in the sand-dunes of Holland.

BUREAU OF PLANT INDUSTRY, Washington, D. C.

EXPLANATION OF THE PLATES.

Plate 102. Lower figure: *Oenothera biennis*, mature rosette of a plant grown as an annual.

Upper figure: The same plant in flower, showing the long branches of the lower axils and the simple inflorescence of the main axis.

Plate 103. Branch and lower leaf of the same plant.

Photographs by B. M. Davis, of "11.16 a *biennis* H," in cultures grown from seeds of de Vries at the University of Pennsylvania, 1911.

REPORTS ON THE FLORA OF THE BOSTON DISTRICT,—XVI.

THE records on which the reports on the *Gramineae* are based have been unusually full, except in the case of some of the more recently described species. Over 3500 of these records are already on file with the Committee. These represent the *Gramineae* of the Gray Herbarium, the Herbaria of the New England Botanical Club, Boston Society of Natural History, Peabody Academy of Science at Salem, Wellesley College and Yale University (Dr. C. W. Swan's collection), and the personal herbaria of J. R. Churchill, Walter Deane, F. F. Forbes, F. W. Grigg, F. Tracy Hubbard, C. H. Knowlton, John Murdoch, Jr., and R. A. Ware.

The collections from the Peabody Academy at Salem and from the Swan Herbarium at Yale were sent to the Gray Herbarium, where they were diligently verified. Prof. M. L. Fernald and Mr. F. Tracy Hubbard have been of special service in this work. The ranges given are based on actual specimens.

In studying *Panicum* constant use has been made of the Hitchcock & Chase monograph, Contrib. U. S. Nat. Herb. xv. 1910.

GRAMINEAE.

ZEA.

[Z. MAYS L. Occasional on waste land and along railways. Probably does not reproduce itself wild.]

ANDROPOGON.

A. furcatus Muhl. Dry open ground, frequent throughout.

A. glomeratus (Walt.) BSP. Moist field, Duxbury (C. H. Knowlton, Sept. 10, 1911); Hingham, according to T. T. Bouvé, The Botany of Hingham, 1893, as *A. macrourus* Michx.

A. scoparius Michx. Dry sandy and rocky soil, very common throughout. Probably our most abundant grass.

A. virginicus Muhl. Dry ground, Blue Hill, Milton (E. & C. E.

Faxon, Oct. 7, 1878; *E. Faxon & J. R. Churchill*, Oct. 17, 1884; *W. H. Manning*, Aug. 15, 1894); Norwood (*E. F. Williams*, Sept. 15, 1895); Waltham (*S. E. French*, Sept. 10, 1888).

TRAGUS.

T. RACEMOSUS Scop. South Boston flats (*C. E. Perkins*, July 20, 1882, and Aug. 20, 1882). A fugitive plant, native in middle and southern Europe, the Canary Islands, Afghanistan and India.

SORGHASTRUM.

S. nutans (L.) Nash. Dry sandy soil, frequent throughout.

SORGHUM.

S. HALEPENSE (L.) Pers. South Boston (*C. E. Perkins*, Sept. 1 and 27, 1880); dump, Watertown (*R. Hoffmann*, Sept. 18, 1899).

S. VULGARE Pers. Dumps and made land; Lawrence, Brookline, Boston and South Boston, not collected recently. Probably seeded from corn-brooms.

DIGITARIA.

D. filiformis (L.) Koeler. Dry sterile soil; frequent except in Essex County, where it is reported only from Andover.

D. HUMIFUSA Pers. Dry soil; frequent from Hingham and Quincy northward, probably throughout.

D. SANGUINALIS (L.) Scop. Waste and cultivated ground, a very common weed throughout.

PASPALUM.

P. Muhlenbergii Nash. Fields and pastures, very common throughout.

P. psammophilum Nash. Dry sand, Halifax (*C. H. Knowlton & W. P. Rich*, July 15, 1906); Duxbury (*C. H. Knowlton*, Sept. 10, 1911). See RHODORA xiv. 174, 1912.

PANICUM.

P. Addisonii Nash, "Andover, *Blake* in 1882"; see Hitchcock & Chase, Contrib. U. S. Nat. Herb. xv. 244, 1910.

P. agrostoides Spreng. Low open ground, frequent.

P. Ashei Pearson. Rocky woods, Melrose (*W. P. Rich*, June 28, 1894, July 4, 1894, June 16, 1895).

P. barbulatum Michx. Dry sandy soil; Malden (*R. Frohock*, 1879); Mattapan, Dorchester (*J. R. Churchill*, June 21, 1890); Sherborn (*M. L. Loomis*, no. 1007, June 14, 1912); Hanson (*J. A. Cushman*, no. 2925, June 5, 1908).

P. boreale Nash. Moist soil, occasional in northern half of district, also at Sharon.

P. Boscii Poir. Rocky woods, Horn Pond Hill, Woburn (*A. S. Pease*, no. 11,364, July 8, 1908); Dorchester (*J. R. Churchill*, July 1, 1882); Natick (*C. H. Knowlton*, Sept. 4, 1898).

P. calliphyllum Ashe. Medford (*C. E. Perkins*, Aug. 3, 1881). The type collection near Ithaca, N. Y., and a collection at Painesville, O. are the only others known. See Hitchcock & Chase, Contrib. U. S. Nat. Herb. xv. 178, 1910.

P. capillare L. Gardens, shores and waste land, a very common weed throughout.

P. clandestinum L. Dry or moist soil, often in thickets or along streams, frequent.

P. Clutei Nash. (*P. mattamuskeetense* Ashe of Gray's Manual, 7th ed., 1908; see Hitchcock & Chase, Contrib. U. S. Nat. Herb. xv. 188, 1910). Framingham (*E. C. Smith*, June 21, 1892).

[*P. columbianum* Scribn. In RHODORA iii. 126, 1901, this species is cited from Nantasket Beach, Massachusetts, collected by Dr. Ezra Brainerd, June 11, 1896; but this specimen has been examined by Hitchcock & Chase who pronounce it to be *P. tsugetorum* Nash, the hairy form called by them "*P. lanuginosum siccanum*" in Contrib. U. S. Nat. Herb. xv. 245, 1910. This variety was published by them in RHODORA, viii. 207, 1906.]

P. commutatum Schultes. Dry bank in woods, Wellesley (*W. P. Rich*, June 14, 1899; see Hitchcock & Chase, Contrib. U. S. Nat. Herb. xv. 306, 1910).

P. dichotomiflorum Michx. Wet shores, cultivated and waste land, frequent.

P. dichotomum L. Woods, usually in dry soil, common throughout.

P. heterophyllum Bosc. (*P. columbianum* Scribn; see Hubbard, RHODORA xiv. 171-2, 1912). Dry sandy soil, sometimes in rich open woods; occasional from Holbrook, Canton, Milton, Westwood, Newton, Wellesley and Framingham northeastward.

P. heterophyllum Bosc, var. **thinium** (Hitchc. & Chase) Hubbard (*P. columbianum* Scribn., var. *thinium* Hitchc. & Chase; see Hubbard, RHODORA xiv. 172, 1912). Winchester (*C. E. Perkins*, Sept. 1, 1882); sandy hillside, Manchester (*F. T. Hubbard*, Oct. 1, 1912).

P. huachucae Ashe. Dry soil, eight stations in central part of district.

P. huachucae Ashe, var. **fasciculatum** (Torr.) Hubbard (var. *silvicola* Hitchc. & Chase; see Hubbard, RHODORA, xiv. 171, 1912). In moister soil than the typical form, often in woods; common from North Scituate, Canton and Norwood northward, probably throughout.

P. implicatum Scribn. Dry and moist soil, common.

P. languidum Hitchc. & Chase. North side of Prospect Hill on new road, Waltham (*E. F. Williams*, Oct. 6, 1895). Mr. F. Tracy Hubbard published in RHODORA xiv. 37, 1912, *P. languidum*, no. 205, from West Gloucester, specimens having been submitted to Mrs. Chase at Washington. Since then Mrs. Chase has decided that the plant is *P. tennesseense* Ashe.

P. latifolium L. Sandy and rocky soil, usually in open woods; frequent in northern and central portions, apparently rare southward.

P. Lindheimeri Nash. Dry soil, rare or local; Manchester, South Boston, West Roxbury, Canton Junction, Wellesley, Framingham.

P. linearifolium Scribn. Dry soil, mostly in woods; occasional, especially in central section.

P. lucidum Ashe. Rich woods, rare; Manchester, Melrose, Quincy, Framingham.

P. macrocarpon Torr. (*P. Scribnerianum* Nash; see Hubbard, RHODORA xiv. 184, 1912). Dry sand and gravel; common in most of the district, but not reported from the extreme south.

[*P. mattamuskeetense* Ashe. The plant reported under this name in RHODORA iii. 114, 1901, proves to be *P. commutatum* Schultes according to Mrs. Chase in litt.]

P. meridionale Ashe. Rich open woods; Beverly Farms, one

specimen (*F. T. Hubbard*, no. 475a, Sept. 29, 1912); near Silver Lake, Wilmington (*G. G. Kennedy*, June 11, 1899); Wellesley, no data, specimen in Herb. Wellesley College;¹ top of Blue Hill, Milton (*G. G. Kennedy*, July 10, 1899); woods by Purgatory Swamp, Norwood (*F. F. Forbes*, June 27, 1903).

P. microcarpon Muhl. Blue Hills (*W. H. Manning*, Aug. 11, 1894); "The Pines," Milton (*G. G. Kennedy*, Aug. 23, 1894); Milton, woods near Crossman's (*J. R. Churchill*, July 4, 1910); Milton (*H. H. Bartlett*, no. 844; see Hitchcock & Chase, Contrib. U. S. Nat. Herb. xv. 182, 1910); Blue Hills, West Quincy (*J. R. Churchill*, July 11, 1891); Wellesley (*W. P. Rich*, June 14, 1899).

P. MILIACEUM L. Waste land, occasional.

P. oligosanthos Schultes. Rocky soil, reasonably common, Waverly, Belmont (*F. T. Hubbard*, Oct. 13, 1912). An extension of range northward from New Jersey.

P. oricola Hitchc. & Chase. Sand dunes, Ipswich (*K. M. Wiegand*, June 25, 1908; *F. T. Hubbard*, Oct. 5, 1911; *M. L. Fernald*, Oct. 15, 1911); Scituate (*F. F. Forbes*, Aug. 15, 1909).

P. philadelphicum Bernh. Muddy and sandy pond shores, rare; Foster's and Long Ponds, Andover; Chadwick's Pond, W. Boxford; Johnson's Pond, Groveland; Winter Pond, Winchester.

P. sphaerocarpon Ell. Dry sandy and gravelly woods and fields, frequent.

P. spretum Schultes. Swamps and marshes, common.

P. strictum Pursh. (*P. depauperatum* Muhl.; see Hubbard, RHODORA xiv. 169, 1912). Dry sandy and gravelly soil, common throughout.

P. subvillosum Ashe. Dry soil, Gloucester, Ipswich, Wilmington, Malden, Woburn, Natick.

P. tenesseeense Ashe. Woods and fields, usually in coarse soil; Gloucester, Manchester, Wenham, Winchester, Cambridge, Boston, Framingham, Milton, Scituate, Sharon, Stoughton.

P. TEXANUM Buckl. Cotton waste from mills, Malden (*F. S. Collins & C. W. Swan*, Sept. 14-15, 1888). A fugitive weed, native in Texas and northern Mexico.

P. tsugetorum Nash. Dry sandy fields and woods, frequent.

¹ The specimens reported in RHODORA xi. 82, 1909, from Wellesley prove to be *P. tsugetorum*; those reported from Ipswich, in the same notice, prove to be *P. tsugetorum* and *P. oricola*.